

Corrosion-resistant alloys

Nicrofer 5716 hMoW – alloy C-276				Nicrofer 4221 – alloy 825			Cunifer 10 – alloy CuNi 90/10		
	Sheet/strip	Tube/pipe	Rod/bar	Sheet/strip	Tube/pipe	Rod/bar	Sheet/strip	Tube/pipe	Rod/bar

DESIGNATIONS AND SPECIFICATIONS

D	Designation	NiMo16Cr15W		NiCr21Mo			CuNi10Fe1Mn		
	Material N.	2.4819		2.4858			2.0872		
	VdTUV	400	-	432/1	432/2	432/3	-	-	-
USA	UNS	N 10276		N 08825			C 70600		
	ASTM(B) ASME(SB)	575	619/622/626	574	424	163/423/704/705	425	122, 171	466/467/111 151
GB	Designation BS	-	-	-	NA16			CN102*	
	BS	-	-	-	3072/3073	3074	3076	2870/2875	2871 2874
F	AFNOR	NC 17 D		NC 21 FeDU				CuNi 10 Fe 1 Mn	

CHEMICAL COMPOSITION (%)

Nickel		Balance		38 - 46		9 - 11
Chromium		15 - 16.5		19.5 - 23.5		-
Molybdenum		15 - 17		2.5 - 3.5		-
Iron		4 - 7		balance		1 - 1.8
Silicon		Max. 0.08		-		-
Others		W: 3 - 4.5 Co: Max. 2.5		Cu: 1.5 - 3		Mn: 0.2 - 1 Zn: Max. 0.5
		V: 0.1 - 0.3				Cu: balance
Titanium		-		0.6 - 1.2		-
Carbon		Max. 0.01		Max. 0.025		-

MECHANICAL PROPERTIES (N/mm², %)

Temperature (°C)	Rp 0.2	Rp 1.0	Rm	A5	Rp 0.2	Rp 1.0	Rm	A5	Rp 0.2	Rp 1.0	Rm	A5
20	Min. 310	Min. 330	Min. 750	Min. 30	Min. 240	Min. 265	Min. 550	Min. 30	Min. 100	Min. 125	Min. 300	Min. 30
100	Min. 280	Min. 305	685	50	Min. 205	Min. 235	530	40	-	Min. 118	-	-
200	Min. 240	Min. 275	680	60	Min. 180	Min. 205	515	40	-	Min. 109	-	-
300	Min. 220	Min. 245	650	65	Min. 170	Min. 195	500	45	-	Min. 99	-	-
400	Min. 195	Min. 230	630	60	Min. 160	Min. 185	490	45	-	-	-	-
450	-	-	-	-	Min. 155	Min. 181	485	45	-	-	-	-
500	-	-	-	-	-	-	-	-	-	-	-	-
600	-	-	-	-	-	-	-	-	-	-	-	-

CREEP PROPERTIES (N/mm²)

Temperature (°C)	Rp 1.0/10 ⁴	Rm/10 ⁴	Rp 1.0/10 ⁵	Rm/10 ⁵
200	98	-	94	-
250	88	-	88	-
300	74	-	74	-

PHYSICAL PROPERTIES AT ROOM TEMPERATURE OR AS INDICATED

Density	g/cm ³	8.9	8.1	8.9
Specific heat	J/Kg K	407	440	380
Thermal conductivity	W/m K	10.6	10.8	45
Electrical resistivity	μΩ	125	112	19
Thermal expansion	10 ⁻⁶ /K	12.8	15.2	17
20-300°C				
Modulus of elasticity	kN/mm ²	208	195	130

FABRICATION CHARACTERISTICS

Formability	Good	Good	Good
Weldability	Good	Good	Good

WELDING PRODUCTS

Filler wire	Nicrofer S 5716 - FM C-276	Nicrofer S 6020 - FM 625	S 4225 - FM 65	Cunifer S 7030 - FM 67	Cunifer S 9010
Covered electrode	2.4887	2.4621	2.4652	2.0838	
	EL-NiMo15Cr15W AWS ENiCrMo-4	EL-NiCr20Mo9Nb	EL-NiCr26Mo	EL-CuNi30Mn	AWS ECuNi

MATERIAL DESCRIPTION, MAIN CHARACTERISTICS

Nickel-chromium-molybdenum alloy with a tungsten addition and extremely low carbon and silicon contents. Excellent resistance to crevice corrosion, pitting and stress-corrosion cracking. Outstanding resistance to a wide range of chemical media, particularly under reducing conditions. Excellent resistance to hot contaminated mineral and organic acids and to seawater.

Titanium-stabilized fully austenitic nickel-iron-chromium alloy with molybdenum and copper additions. Excellent resistance to stress-corrosion cracking, good resistance to pitting and crevice corrosion. Good resistance to oxidizing and reducing acids such as sulfuric, phosphoric and nitric acid and to organic alkaline solutions, alkalis and seawater. Approved for pressure vessel operating temperatures up to 425°C (800°F).

Copper-nickel alloy with approx. 10% nickel and iron and manganese additions. Good resistance to seawater and to brackish and industrial waters. Good resistance to flowing clean seawater (flow velocities from 1 to 3.5 m/s). Good resistance to stress corrosion cracking.